

Amendments to Specification

Please replace the Brief Description of the Figures and Sequence Descriptions with the following:

**BRIEF DESCRIPTION OF THE FIGURES AND
SEQUENCE DESCRIPTIONS**

The invention can be more fully understood from the following detailed description and the accompanying sequence descriptions, which form a part of this application.

The following sequences conform with 37 C.F.R. 1.821-1.825 ("Requirements for Patent Applications Containing Nucleotide Sequences and/or Amino Acid Sequence Disclosures - the Sequence Rules") and are consistent with World Intellectual Property Organization (WIPO) Standard ST.25 (1998) and the sequence listing requirements of the EPO and PCT (Rules 5.2 and 49.5(a-bis), and Section 208 and Annex C of the Administrative Instructions). The symbols and format used for nucleotide and amino acid sequence data comply with the rules set forth in 37 C.F.R. §1.822.

SEQ ID NO:1 is the amino acid sequence of the monomer of the spider silk DP-1A analog protein.

SEQ ID NO:2 is the amino acid sequence of the monomer of the spider silk DP-1B.9 analog protein.

SEQ ID NO:3 is the amino acid sequence of the monomer of the spider silk DP-1B.16 analog protein.

SEQ ID NO:4 is the amino acid sequence of the monomer of the spider silk DP-2A analog protein.

SEQ ID NO:5 is the amino acid sequence of the consensus repeat sequence representing spider silk analog protein DP-1.

SEQ ID NO:6 is the amino acid sequence of a portion of the consensus repeat sequence representing spider silk analog protein DP-1.

SEQ ID NO:7 is the amino acid sequence of one of the repeat sequences representing the spider silk analog protein DP-1.

SEQ ID NO:8 is the amino acid sequence of one of the repeat sequences representing the spider silk analog protein DP-1.

SEQ ID NO:9 is the amino acid sequence of the consensus repeat sequence representing spider silk analog protein DP-2.

SEQ ID NOs:10 and 11 are the amino acid sequences of possible

deletions in the consensus repeat sequence representing spider silk analog protein DP-2.

SEQ ID NOs: 12-14 are the amino acid sequence of three of the repeat sequences representing the spider silk analog protein DP-2.

Please replace the first full paragraph of page 14 with the following:

The preferred water-soluble silk proteins of the present invention are spider silk analog proteins, as described by Fahnestock in US Patent No. 6,268,169, incorporated herein by reference. These silk proteins are analog proteins of the natural dragline spider silk Spidroin 1 (DP-1) and Spidroin 2 (DP-2) proteins of *Nephila clavipes*. Two analogs of DP-1 were designed and designated DP-1A and DP-1B. DP-1A is composed of a tandemly repeated 101-amino acid sequence. The 101-amino acid "peptide monomer", given as SEQ ID NO:1, comprises four repeats which have different patterns that reflect the variation of the individual repeating units of DP-1 from the consensus sequence. This 101-amino acid long peptide monomer (SEQ ID NO:1) was repeated from 1 to 16 times in a series of analog proteins. DP-1B was designed by reordering the four repeats within the monomer of DP-1A. Two sets of genes using different codons were designed to produce DP-1B, specifically DP-1B.9 and DP-1B.16. The resulting amino acid monomer sequences are given as SEQ ID NO:2 for DP-1B.9 and SEQ ID NO:3 for DP-1B.16. The sequence of DP-1B matches the natural sequence of Spidroin 1 more closely over a more extended segment than does DP-1A. The DP-1 amino acid sequences and similar analogs may be represented by the following consensus repeat formula (SEQ ID NO:5):



wherein X=S, G or N; n=0-7 and z=1-75, and wherein the value of z determines the number of repeats in the variant protein. The formula encompasses variations selected from the group consisting of: (a) when n=0, the sequence encompassing AGRGGLGGQGAGAnGG, given as SEQ ID NO:6, is deleted, resulting in the sequence given as SEQ ID NO:7; (b) deletions other than the poly-alanine sequence, limited by the value of n will encompass integral multiples of three consecutive residues; (c) the deletion of GYG in any repeat is accompanied by deletion of GRG in the same repeat, resulting in the sequence given as SEQ ID NO:8; and (d) where a first repeat where n=0 is deleted, the first repeat is preceded by a second repeat where n=6; and wherein the full-length protein is encoded by a gene or genes and wherein said gene or genes are not endogenous to the *Nephila clavipes* genome.

Please replace the first paragraph of page 15 with the following:

Synthetic analogs of DP-2 were designed to mimic both the repeating consensus sequence of the natural protein and the pattern of variation among individual repeats of Spidroin 2. The analog DP-2A, given as SEQ ID NO:4, is

composed of a tandemly repeated 119-amino acid sequence. This 119-amino acid "peptide monomer" comprises three repeats which have different patterns. This 119-amino acid long peptide monomer was repeated from 1 to 16 times in a series of analog proteins. The spider silk analog protein DP-2A is the most preferred water-soluble silk protein of the present invention. The DP-2 amino acid sequence and similar analogs may be represented by the following consensus repeat formula (SEQ ID NO:9):

[GPGGYGPGQQGPGGYGPGQQGPGGYGPGQQGPSGPGSAn]z (2)

wherein n=6-10 and z=1-75 and wherein, excluding the poly-alanine sequence, individual repeats differ from the consensus repeat sequence by deletions of integral multiples of five consecutive residues consisting of one or both of the pentapeptide sequences GPGGY (SEQ ID NO:10) or GPGQQ (SEQ ID NO:11), resulting in the sequences given as SEQ ID NOs:12-14, and wherein the full-length protein is

encoded by a gene or genes and wherein the gene or genes are not endogenous to the *Nephila clavipes* genome.